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(71) Applicant(s)	(52) UK CL (Edition S ) <b>E2A ALX A106 A160 A554</b>
<p><b>Kevin Beattie</b>  <b>2 River Street, MACCLESFIELD, Cheshire, SK11 7NY,</b>  <b>United Kingdom</b></p>	<p>(56) Documents Cited  <b>DE 003914895 A    US 3948550 A    US 1800662 A</b>  <b>US 1471061 A</b></p>
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<p><b>Kevin Beattie</b></p>	<p>UK CL (Edition S ) <b>E2A AEA ALQ ALX</b></p>
(74) Agent and/or Address for Service	<p>INT CL<sup>7</sup> <b>E05B 17/20</b></p>
<p><b>Kevin Beattie</b>  <b>2 River Street, MACCLESFIELD, Cheshire, SK11 7NY,</b>  <b>United Kingdom</b></p>	<p>Online : <b>WPI, PAJ, EPODOC ;</b></p>

(54) Abstract Title  
**Lock having grooved latch bolt to prevent unauthorised opening**

(57) A lock 30 has a slidable latch bolt 12 operable by turning knob 19 or a key inserted in a keyhole on the other side of the lock.. The latch bolt 12 is provided with one or more grooves 23, 27 on its tapered side to prevent it being moved by the insertion of a flexible sheet, such as a credit card, between the door 13 and door frame 17. The grooves 23,27 may be saw tooth shaped.

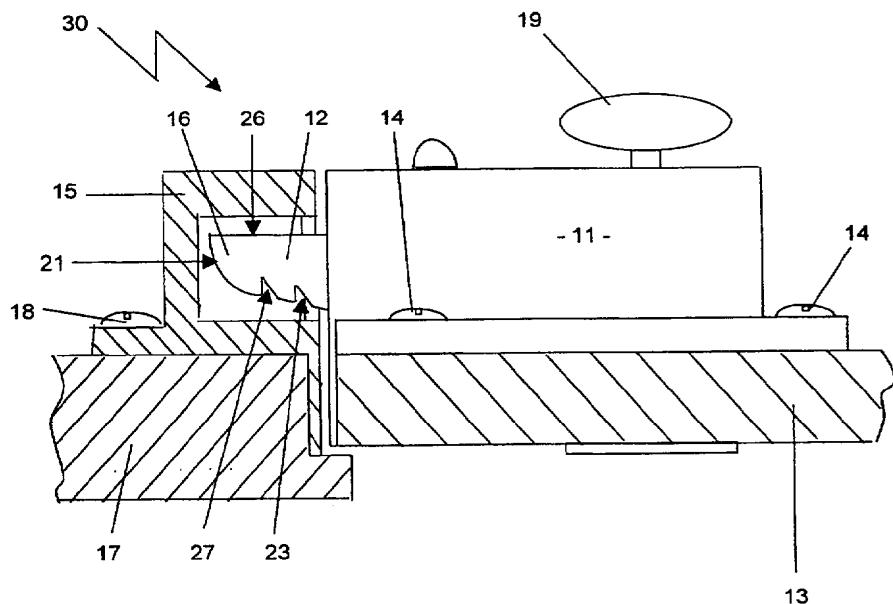


Fig. 4

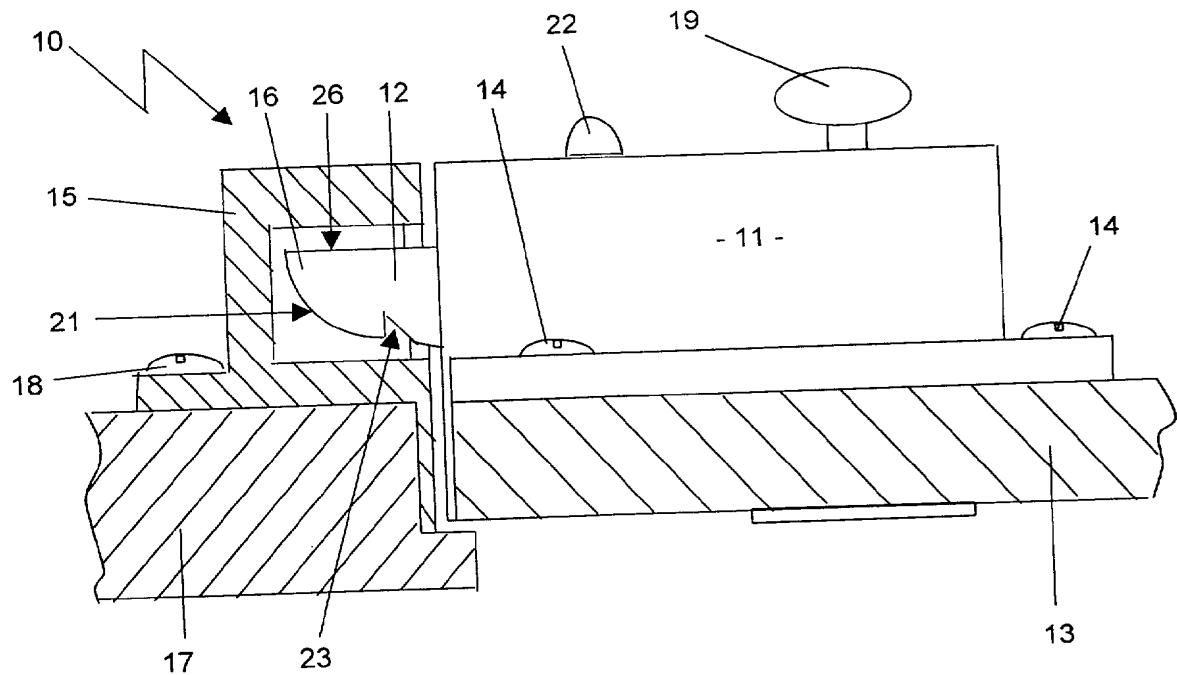


Fig. 1

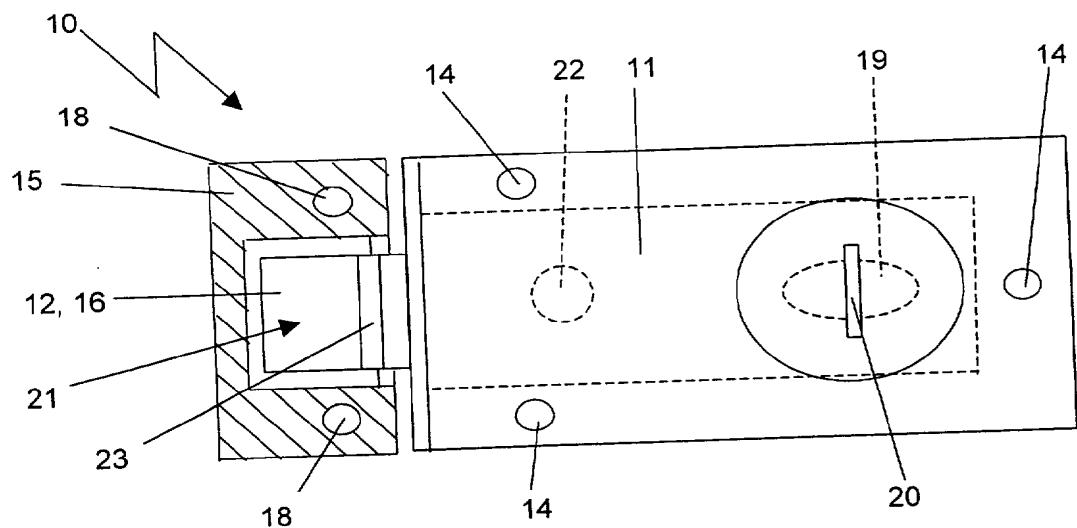


Fig. 2

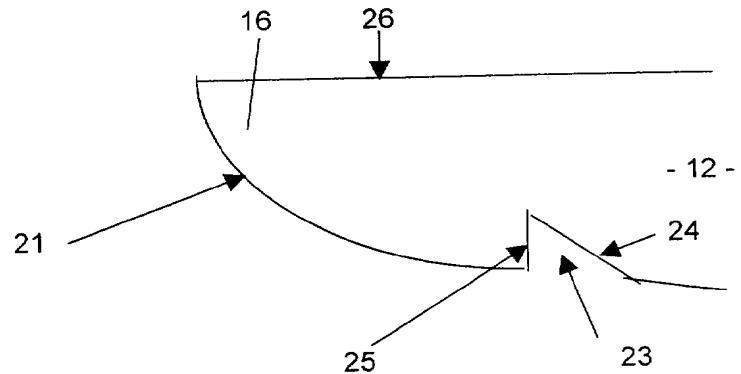


Fig. 3

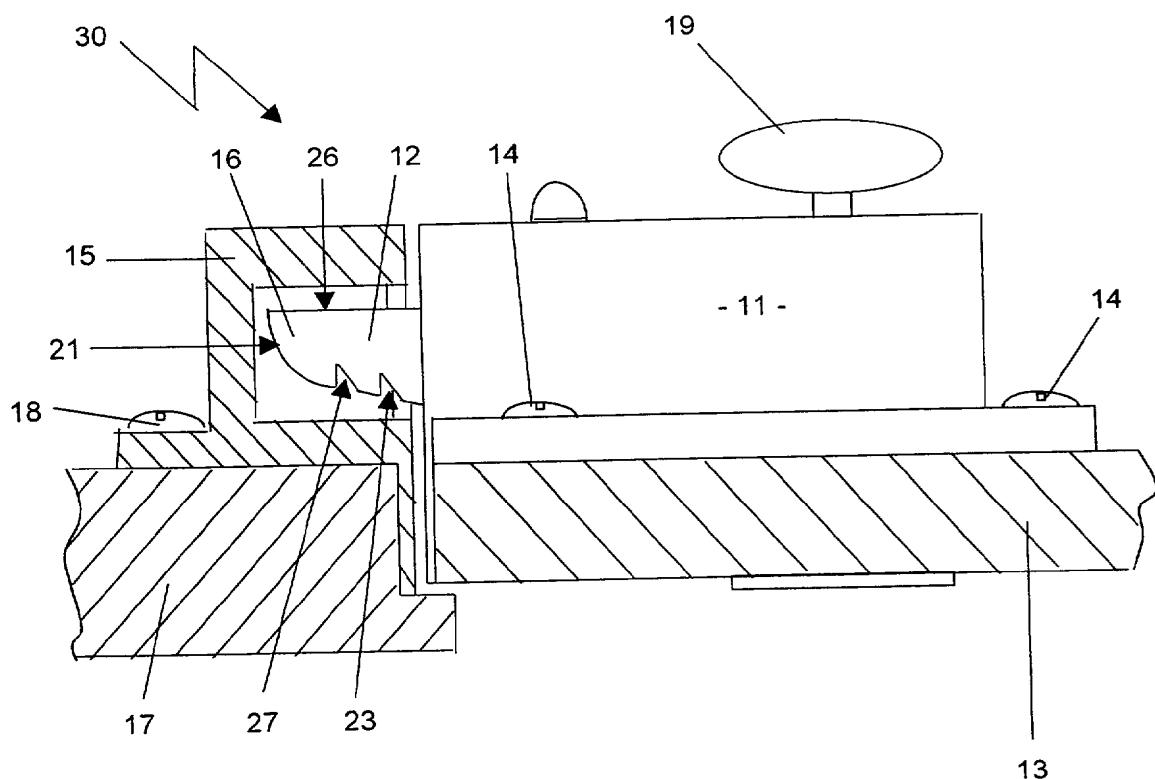


Fig. 4

## SECURITY DEVICE

This invention relates to security devices, and in particular to means for preventing unauthorised access to a building or enclosure.

Generally unauthorised access to a building or enclosure is prevented, or at least hindered, by the provision of a lock to the door or other means of access. In the case of houses and other premises, common forms of lock are the cylinder and rim locks, particularly the former. In referring to a lock, 'inside' is intended to mean that side of the lock which faces inwardly of the building or enclosure and 'outside' that side of the lock which faces outwardly of the building or enclosure. Such locks have a latch bolt with an inwardly inclined outwardly facing surface to provide a tapered free end which, in the locked position, protrudes from the body of the lock into a catcher housing or a recess in the door frame surrounded by an apertured catcher plate. The tapered end of the latch bolt provides that the latch bolt is pushed back by the catcher housing or plate into the body of the lock when the door is closed, thereby obviating the need to turn the key in the lock to effect door closure. It has been well known for many years that such locks can be overcome by inserting a sheet of flexible but stiff material, such as a credit card, between the door and the door frame to force the latch bolt to retreat into the body of the lock in the same manner as the catcher housing or plate does on closing the door. To provide greater security when the authorised persons are inside the building and prevent entry by such means, the lock may be provided with a disabling catch which is operated from inside the building. This provides no added security when the authorised persons are outside the building since the catch cannot be activated. Another method of providing greater security is to provide that on turning the key in the lock from the outside of the building in a direction opposed to that required to open the lock, the latch bolt is secured in the extended, i.e. locked position. However this method cannot be used when an authorised person is inside the building, for example if that person enters the building by another entrance, since the door cannot be opened from inside. This can lead to a dangerous situation in the event of a fire or other emergency. To avoid both of the above problems, a dead lock may be installed instead of, or as an addition to, the conventional lock, the dead lock having a latch bolt with a non-tapered free end. In both cases the door cannot be closed without the use of a key, but in the second case this involves the use of two keys in order to open the door. This may be similarly dangerous or at least inconvenient.

It is an object of the present invention to provide a security device with the convenience of a cylinder or rim lock of the conventional type, but whereby unauthorised access to a building or other enclosure by the above described method can be prevented.

The invention provides a security device comprising a lock having a latch bolt movable between an opening position in which it is retracted into the body of the lock and a locked position in which it protrudes from the body, the latch bolt having an inwardly inclined outwardly facing surface to provide a tapered free end which, in the locked position, protrudes from the body of the lock, wherein the latch bolt is provided with at least one groove therein disposed to extend across the inclined surface substantially transversely of the direction of motion of the latch bolt.

The groove may be of V-shaped cross-section, and may be saw-tooth cross-section having a first surface remote from the free end inwardly inclined at a greater angle than the inclined surface and a second surface substantially perpendicular to the inwardly facing surface of the latch bolt. The inclined surface may be curved, in which case the first surface may be inclined at a greater angle than the inclination of the inclined surface at the location of the groove. The depth of the groove may be at least 1.5 mm.

The lock may be provided with a disabling catch which is operable from the inside thereof. The lock may also be adapted whereby on turning the key in the lock from the outside thereof in a direction opposed to that required to open the lock, the latch bolt is secured in the extended position.

The invention will now be further described with reference to the accompanying drawing in which;

- Fig. 1 is a partly sectioned plan view of one embodiment,
- Fig. 2 is a partly sectioned view from outside of the lock of Fig. 1,
- Fig. 3 is a scrap view to an enlarged scale of the latch bolt of the embodiment of Figs. 1 and 2, and
- Fig. 4 is a partly sectioned plan view of a second embodiment.

Referring now to Figs. 1 and 2, there is shown a security device in the form of a lock 10 of the cylinder type. The lock 10 comprises a body 11 and a latch bolt 12. The body 11 is secured to the inside of a door 13, not shown in Fig. 2 for clarity, by screws 14. When the door 13 is closed, as shown, and lock 10 is in the locked position, the latch bolt 12 extends out of the body 11 and the free end 16 thereof enters a catcher housing 15. The catcher housing 15 is secured to the inside of the door frame 17 by screws 18. Turning the knob 19 on the inside of the lock 10 or a key (not shown) inserted in a keyhole 20 (Fig. 2) in the outside of the lock 10 operates the lock mechanism to retract the latch bolt 12 from the catcher housing 15 and into the body 11, thereby allowing the door 13 to be opened. The free end 16 of the latch bolt 12 is

tapered in plan view so that the latch bolt 12 is pushed back by the catcher housing 15 into the body 11 when the door 13 is closed, thereby obviating the need to turn the key in the lock 10 to effect closure of the door 13. The tapered free end 16 is formed by an inwardly inclined outwardly facing surface 21. A disabling catch 22 is provided which is operable from the inside of the lock 10 when the door 13 is closed and the latch bolt 12 is in the extended position. When the catch 22 is slid from an inoperative position, in which movement of the latch bolt 12 can occur, to a disabling position, the latch bolt 12 is prevented from moving from this extended, door 13 securing position, so that operation of the lock 10 from outside with a key is prevented. The lock 10 may also be adapted whereby on turning a key in the lock 10 from the outside in a direction opposed to that required to retract the latch bolt 12, the latch bolt 12 is secured in the extended position. In this situation, turning the knob 19 to retract the latch bolt 12 is prevented. Thus far, the lock 10 is conventional. If a sheet of flexible but stiff material, such as a credit card, is inserted between the door 13 and the door frame 17, it will come into contact with the inclined surface 21 and force the latch bolt 12 to retreat into the body 11 of the lock 10 in the same manner as the catcher housing 15 does on closing the door 13.

To prevent such an occurrence, the latch bolt 12 is provided with a groove 23 in the inclined surface 21. The groove 23 extends across the inclined surface 21 in a direction perpendicular to the direction of movement of the latch bolt 12. The groove 23 is of V-shaped, and more particularly saw-tooth formation, in cross-section, as more clearly shown in Fig. 3. The groove 23 is formed by a first surface 24 remote from the free end 16 inwardly inclined at a greater angle than the inclined surface 21 at that location, and a second surface 25 nearest the free end 16 that is perpendicular to the inside face 26 of the latch bolt 12. If a credit card or other thin, flexible but stiff card or implement is inserted between the door 13 and the door frame 17, it may contact the inclined surface 21 initially, but will then enter the groove 23, slide down the first surface 24 and abut the second surface 25. This may cause an initial small retraction of the latch bolt 12, but will then cause the latch bolt 12 to be urged towards the fully extended position. In this way the opening of the door 13 by this unauthorised method is prevented.

Fig. 4 shows a lock 30 which is similar to lock 10, and corresponding parts are identified by the same reference numerals. In this embodiment however, the latch bolt 12 is provided with a second groove 27 to provide even more security in case the card or implement avoids the groove 23.

By means of the invention a security device is provided which has the convenience of a cylinder or rim lock of the conventional type, but whereby unauthorised access to a building or other enclosure, by inserting a sheet of flexible but stiff material between the door and the door

frame, can be prevented. The present device can be readily manufactured by the manufacturers of conventional locks by a small and very simple change to their existing manufacturing equipment and methods. The cost of the security device of this invention will be no greater than the cost of conventional cylinder or rim locks, however the present device provides a considerable increase in security compared with conventional locks. The groove 23 or grooves 23, 27 are located at or adjacent the thickest part of the latch bolt 12, so that there will be substantially no weakening of the latch bolt 12 compared with conventional latch bolts.

## WHAT I CLAIM IS

1. A security device comprising a lock having a latch bolt movable between an opening position in which it is retracted into the body of the lock and a locked position in which it protrudes from the body, the latch bolt having an inwardly inclined outwardly facing surface to provide a tapered free end which, in the locked position, protrudes from the body of the lock, wherein the latch bolt is provided with at least one groove therein disposed to extend across the inclined surface substantially transversely of the direction of motion of the latch bolt.
2. A security device according to claim 1, wherein the groove is of V-shaped cross-section.
3. A security device according to claim 2, wherein the groove is of saw-tooth cross-section having a first surface remote from the free end inwardly inclined at a greater angle than the inclined surface and a second surface substantially perpendicular to the inwardly facing surface of the latch bolt.
4. A security device according to any one of claims 1 to 3, wherein the inclined surface is curved.
5. A security device according to claim 4 when dependent on claim 3, wherein the first surface is inclined at a greater angle than the inclination of the inclined surface at the location of the groove.
6. A security device according to any one of claims 3 to 5, wherein the depth of the groove is at least 1.5 mm.
7. A security device according to any one of claims 1 to 6, wherein the lock is provided with a disabling catch which is operable from the inside thereof.
8. A security device according to any one of claims 1 to 7, wherein the lock is adapted whereby on turning a key in the lock from the outside thereof in a direction opposed to that required to open the lock, the latch bolt is secured in the extended position.
9. A security device substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 3 or Fig. 4 of the accompanying drawings.



INVESTOR IN PEOPLE

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Claims searched: 1-9

Examiner: Phil Thorpe  
Date of search: 31 January 2001

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): E2A (AEA, ALQ, ALX) ;

Int Cl (Ed.7): E05B (17/20) ;

Other: Online : (WPI, PAJ, EPODOC) ;

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	US 3948550 A (Vigluicci et al) - See groove 18 in the figures.	1-5,7,8
X	US 1800662 A (Rush) - See groove 10 in the figures.	1-5,7,8
X	US 1471061 A (Reinman) - See groove 6 in the figures.	1-5,7,8
X	DE 3914895 A (Fricke) - See figures 1-5 and WPI Abstract Accession no. 1990-342643.	1-8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.